Small Business Innovation Research/Small Business Tech Transfer

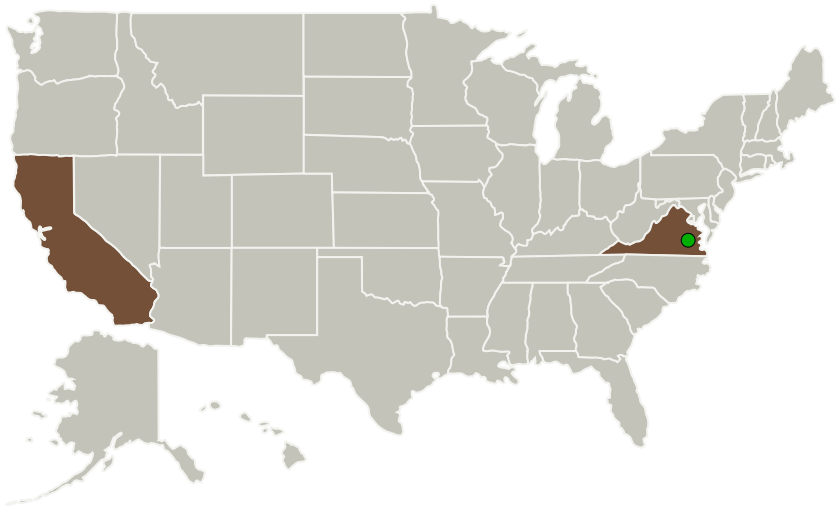
A Formal Approach to User Interface Design Using Hybrid System Theory, Phase I

Completed Technology Project (2013 - 2013)

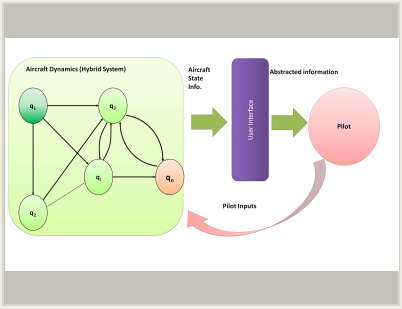
Project Introduction

Optimal Synthesis Inc.(OSI) proposes to develop an aiding tool for user interface design that is based on mathematical formalism of hybrid system theory. The correctness of information content of a user interface is ensured by a special observability test that takes into account of human cognition and psychology. A possible mismatch between an operational mode perceived by a human operator and the one active in a machine is detected via an algorithm that infers the intent of the human operator and generates an alert if a discrepancy from the mode of the machine is found. The developed tool is evaluated by considering standard operations in the national air space in the absence and the presence of a system fault.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Optimal Synthesis, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Los Altos, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia



A Formal Approach to User Interface Design using Hybrid System Theory

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

A Formal Approach to User Interface Design Using Hybrid System Theory, Phase I

Completed Technology Project (2013 - 2013)

Primary U.S. Work Locations	
California	Virginia

Project Transitions

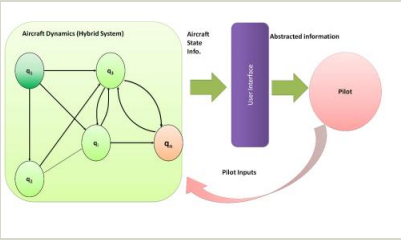
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140356)*

Images



Project Image
A Formal Approach to User Interface Design using Hybrid System Theory
(https://techport.nasa.gov/image/126115)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Optimal Synthesis, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

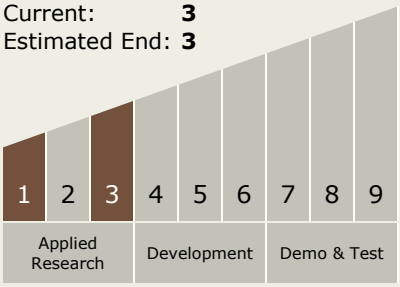
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Bong-jun Yang

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.4 Architectures and Infrastructure

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System